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REMARKS

Claims 1-20 are pending. The Office action rejects claims 14 and 16-20 and objects to claim 15.

Claim Amendments

In anticipation of allowance the following claim amendments are made:

Claim 1 is amended to remove a typographical error (an identical clause was repeated twice);

Claims 8 and 16 are amended to provide a proper antecedent basis for image data; and

Claim 9 is amended to correct a minor wording error.

Response to Examiner's Position Regarding Structural Limitations

The Examiner is thanked for his careful and thoughtful consideration of the subject application over its relatively extended prosecution history. The Applicants ask the Examiner to consider the following and then to allow the subject application to allowance.

The Applicants consider that the Examiner's position on page 11, paragraph 8 of the December 8, 2005 final Office Action delineates the difference between the parties. Specifically, whether claims 1-14 and 16-20 are unpatentable in view of the holdings of *In re Casey*, 152 USPQ 235 (CCPA 1967) and of *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Those holdings stand for the proposition that a recitation of the intended use of a claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. Succinctly put, if the prior art structure is capable of performing the intended use, then it meets the claim. While the forgoing may be correct, such is not applicable to the instant invention since structural differences are claimed.

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The Applicants' invention relates to a liquid crystal display (LCD) device in which data drivers provide image data to data lines, and in which a switch selectively connects two of the data lines together such that image data is simultaneously applied to at least two data lines (see, generally claims 1, 8, and 16, but a complete copy of all of the claims is set forth above).

The Applicants assert that the claimed structural limitations include data drivers that provide image data and a switch that selectively connects data lines when image data is provided. While it may be well known that data drivers provide image data, there is no support for the proposition that prior art devices were capable of performing the claimed invention. For example, prior art devices were not capable of selectively switching two data lines together when image data was being produced so that image data was simultaneously applied to multiple data lines.

After the Applicants' described their invention it arguably may not be difficult for others to implement, but before the Applicants did so no one knew to, and thus could not, practice the present invention. The Applicants do not claim connecting data lines together, they do claim selectively doing so when image data is present. As such is not obvious over the prior art, withdrawal of the 35 U.S.C. §103 rejection of claims 1-14, 16-20 is respectfully requested.

Rejection of Claims 1-3, 14, 16-17, and 19 under 35 U.S.C. §103(a)

The December 8, 2005 Office action rejects claims 1-3, 14, 16-17 and 19 under 35 U.S.C. §103(a) over allegedly admitted prior art (APA) in view of Haruhiko, JP No. 07-199866 and further in view of Murade (US 6,330,044 B1). Applicants respectfully traverse this rejection. As explained below, claims 1-3, 14, 16-17 and 19 are patentable under 35 U.S.C. §103(a) over any permissible combination of APA and the cited references.

Applicants APA relates to LCD devices comprised of imaging pixels arranged in a matrix of rows and columns. Each imaging pixel includes a pixel-

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switching device having first and second terminals and a control terminal that controls switching between the first and second terminals. A pixel storage device is associated with each imaging pixel. Data lines connect "columns" of second terminals together; data drivers connect to the data lines, and the data drivers apply image data to the data lines. Scanning lines connect the pixel-switching device control terminals into rows, and scanning signals on the scanning lines control the operations of the pixel-switching devices. By driving columns of pixel-switching devices with image data while selectively applying scanning signals the desired image data can be selectively stored in the pixel storage devices such that the LCD produces a desired composite image.

Practical implementations of LCD devices must address various issues. One set of issues relates to driving the data lines. For various reasons it is desirable to drive a data line using one stored charge polarity (for example, positive) in one period and the opposite stored charge polarity (negative) in the next period. It is also beneficial to use opposite charge polarities in adjacent data lines. This requires that stored charges be neutralized in each period. To reduce power consumption Haruhiko teaches selectively connecting adjacent data lines together in non-imaging periods such that charges in adjacent data lines neutralize each other. Specifically, Haruhiko teaches shorting switches that selectively short adjacent lines together during non-imaging periods.

Murade at column 11, lines 56-67 teaches that multiple data lines can be driven simultaneously by different data drivers. However, the present invention recites driving multiple (two) data lines with imaging data from one driver. In fact, the operation of the Murade items 109 noted by the Examiner is not described until column 12, lines 23-48. There, Murade teaches that items 109 are used to "pre-charge" the data lines during a "period of a horizontal retrace line of the image signal." In addition, or in the alternative, column 12, lines 23-48 of Murade describe the use of items 109 during inspection. However, Murade does not teach or suggest connecting data lines together so that one

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data drive can drive both lines during imaging.

Claims 1-3, 14, 16-17 and 19, are allowable under 35 USC §103(a) at least because they recite, either directly or indirectly, selectively connecting data lines such that image data is simultaneously applied to two data lines.

Specifically, claim 1 recites:

"at least one switch responsive to a corresponding control signal to selectively connect two of the data lines to each other such that image data applied by a data driver is simultaneously applied to at least two data lines;"

claim 8 recites:

"connecting the defective column line to a second column line of the plurality of column lines by applying a control signal to selectively close a switch such that image data applied to the second column line is applied to the defective column line"

and claim 16 recites:

"means for selectively connecting two column lines to each other such that image data applied by a data driver is simultaneously applied to two data lines."

Patentable differences between the pending independent claims and permissible combinations of APA and Haruhiko include that in the pending independent claims columns are selectively connected together such that image data on one data line is switched onto another data line. This enables a controlled "repair" of defective lines by reducing the impact of defective drivers/lines. Instead of a defect causing a "blank" line a "defective" line is driven by image data from an adjacent driver. This markedly reduces the impact of the defect. In contrast, the APA, Haruhiko, and Murade, individually or

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collectively, fail to teach simultaneously connecting data lines together during imaging periods.

Thus claims 1-3, 14, 16-17 and 19 are allowable over the cited references. Accordingly, withdrawal of the 35 U.S.C. §103 rejection of claims 1-3, 14, 16-17 and 19 is respectfully requested.

Rejection of Claims 3 and 18 under 35 U.S.C. §103(a)

The December 8, 2005 Office action rejects claims 3 and 18 under 35 U.S.C. §103(a) over applicant's admitted prior art (APA), Haruhiko, and Murade as aforementioned above, and further in view of Keeney et al. (Pub. No. US 2002/0113766 A1). Applicants respectfully traverse this rejection.

The Admitted Prior Art (APA), Haruhiko, and Murade are discussed above. Keeney teaches repairing an inoperative pixel (or pixels) by disconnecting the pixel (or pixels) from its (their) driver(s) and then reconnecting the inoperative pixel (or pixels) to another driver (or drivers), reference, for example, paragraph 0037, Figure 1, and Figure 2. To that end, Keeney teaches the use of bypass latches and multiplexers to selectively connect pixels to drive circuitry. However, Keeney does not suggest selectively connecting a defective data line to another data line during imaging periods such that one driver can drive both data lines. In fact, Keeney discloses in paragraph 0034 that defective column lines will render an entire display unusable, and suggests adding spare rows and columns.

Consequently, Keeney does nothing to close the substantial gap between the pending independent claims and permissible combinations of APA, Haruhiko, and Murade. All permissible combinations of APA, Haruhiko, Murade, and Keeney fail to suggest LCD operations such that "image data applied by a data driver is simultaneously applied to at least two data lines" (claim 1) or that image data applied to a second column line is applied to a defective column line (see claim 8). As claim 3 depends from allowable claim 1 and includes all of the

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limitations of that claim, claim 3 is allowable. As claim 18 depends from allowable claim 16 and includes all of the limitations of that claim, claim is allowable. Accordingly, withdrawal of the 35 U.S.C. §103(a) rejection of claims 3 and 18 is respectfully requested.

Rejection of Claims 4, 6, and 20 under 35 U.S.C. §103(a)

The December 8, 2005 Office Action rejects claims 4, 6 and 20 under 35 U.S.C. §103(a) over applicant's admitted prior art (APA), Haruhiko, and Murade, and further in view of Lee et al. (US 6,028,442) ("Lee"). Applicants respectfully traverse this rejection.

The teachings of Admitted Prior Art (APA), Haruhiko and Murade are discussed above. Lee teaches testing groups of data lines by shorting numerous data lines together and then applying a test voltage to the shorted lines. While Lee may teach a useful method of testing an LCD, Lee does not teach or suggest connecting two adjacent columns together and then driving them both with image data. Thus Lee does not make up for the deficiencies in those references. Consequently, claims 1 and 16, from which claims 4-6 and 20 depend, are patentable under 35 USC §103(a) at least because the patentable features discussed above are not found in any combination of the cited materials.

Consequently the pending independent claims remain allowable over any permissible combination of the Admitted Prior Art (APA), Haruhiko, Murade, and Lee. As claims 4, 6, and 20 include all of the limitations of their base claims, claims 4, 6, and 20 are also allowable. Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection of claims 4, 6, and 8 is requested.

Rejection of Claims 5 and 7 under 35 U.S.C. §103(a)

The December 8, 2005 Office action rejected claims 5 and 7 as being unpatentable over the Admitted Prior Art (APA), Haruhiko, Murade, Lee, and in

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view of Keeney. With all respect to the Examiner that rejection is respectfully traversed.

The teachings of the Admitted Prior Art (APA), Haruhiko, Murade, Keeney, and Lee are all discussed above. No permissible combination of those references, suggests LCD operations such that -image data applied by a data driver is simultaneously applied to at least two data lines. (see claim 1). Consequently claim 1 remains allowable over Admitted Prior Art (APA), Haruhiko, Murade, Keeney, and Lee. As claims 5 and 7 depend from allowable claim 1 and include all of the limitations that claim, claims 5 and 7 are also allowable. Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection of claims 5 and 7 is requested.

Rejection of Claims 8-9 and 13 under 35 U.S.C. §103(a)

The December 8, 2005 Office action rejected claims 8-9, and 13 as being unpatentable over Henley (US patent 5,459,410) in view of Haruhiko and in further view of Murade. With all respect to the Examiner that rejection is respectfully traversed.

The teachings of Haruhiko and Murade are discussed above. Henley teaches an LCD inspection process in which repairable defects are identified and corrected early in the manufacturing process. Open and shorted lines (columns and rows) are identified and repaired by depositing conductive material or by laser ablation.

Claim 8 recites, among other things:

"connecting the defective column line to a second column line of the plurality of column lines by applying a control signal to selectively close a switch such that image data applied to the second column line is applied to the defective column line"

No permissible combination of Henley, Haruhiko, and Murade teach or

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suggest selectively closing a switch such that image data applied to a second column line is applied to a defective column line. Consequently, claim 8 is allowable over Henley, Haruhiko, and Murade. Furthermore, since claims 9, and 13 depend from allowable claim 8, and thus include all of its limitations, those claims are also allowable. Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection of claims 8-9 and 13 is requested.

Rejection of Claim 10 under 35 U.S.C. §103(a)

The December 8, 2005 Office action rejected claim 10 as being unpatentable over Henley, Haruhiko and Murade in view of Keeney et al. With all respect to the Examiner that rejection is respectfully traversed.

The teachings of Henley, Haruhiko, Murade, and Keeney are all discussed above. No permissible combination of Henley, Haruhiko, Murade, and Keeney teach or even suggest selectively closing a switch such that image data applied to a second column line is applied to a defective column line as recited in claim 8. Consequently, claim 8 is allowable over of Henley, Haruhiko, Murade, and Keeney. Furthermore, as claim 10 depends from allowable claim 8, and thus includes all of its limitations, claim 10 is also allowable. Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection of claim 10 is requested.

Rejection of Claim 12 under 35 U.S.C. §103(a)

The December 8, 2005 Office Action rejected claim 12 as being unpatentable over Henley, Haruhiko, and Murade in view of Lee. With all respect to the Examiner that rejection is respectfully traversed..

The teachings of Henley, Haruhiko, Murade and Lee are all discussed above. No permissible combination of Henley, Haruhiko, Murade and Lee teach or even suggest selectively closing a switch such that image data applied to a second column line is applied to a defective column line as recited in claim 8. Consequently, claim 8 is allowable over Henley, Haruhiko, Murade and Lee.

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Furthermore, claim 12 depends from allowable claim 8, includes all of its limitations and is thus also allowable. Accordingly, withdrawal of the 35 U.S.C. §103(a) rejection of claim 12 is requested.

CONCLUSION


The applicants submit that all pending claims are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly requested.

If the Examiner deems that a telephone call would further the prosecution of this application, the Examiner is invited to call Mr. Eric Bram at (914) 333-9635. All correspondence should continue to be sent to the address of record (not to the signing attorney).

If these papers are not considered timely filed by the United States Patent and Trademark Office, or if any additional fees are required, kindly charge that fee to deposit account number 20-0782.

Respectfully submitted,

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